Trend Study 16C-39-02

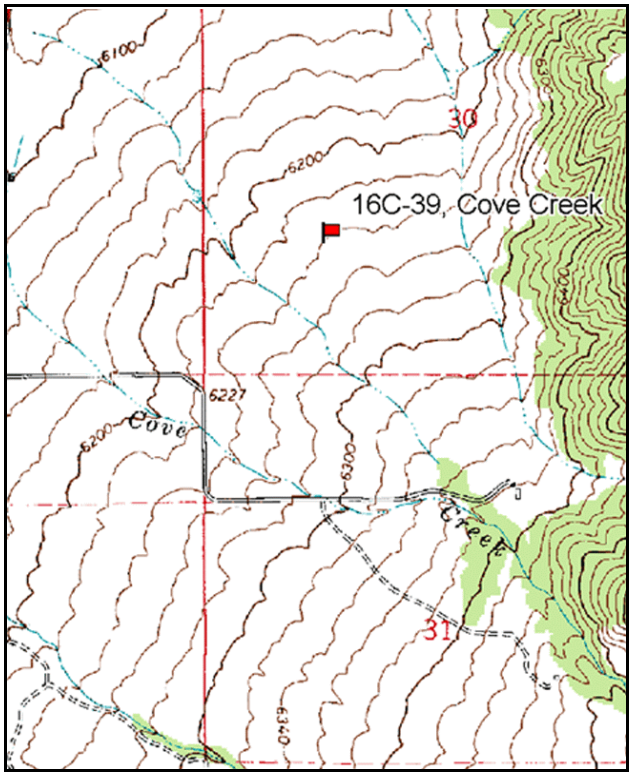
Study site name: Cove Creek. Vegetation type: Bitterbrush.

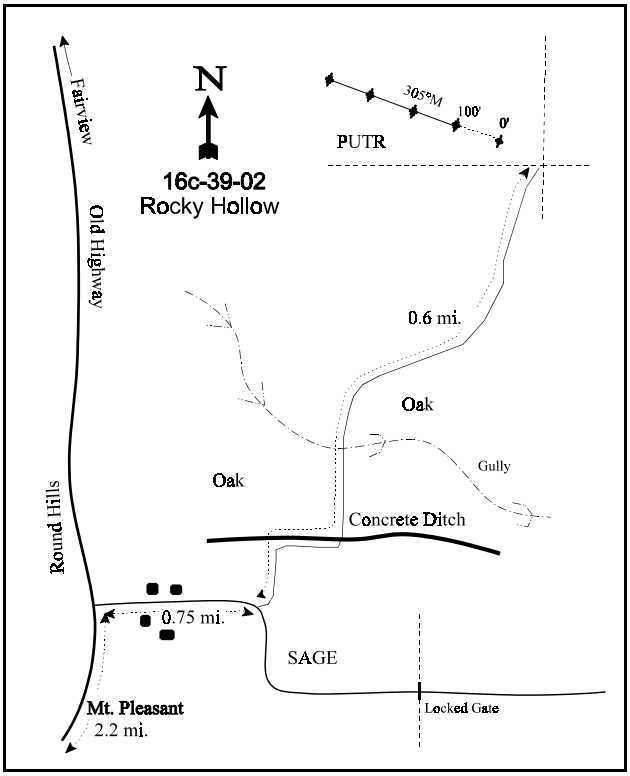
Compass bearing: frequency baseline 305 degrees magnetic.

Frequency belt placement: line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

From State Street (Highway 89) and 200 North in Mt. Pleasant, proceed east on 200 North which curves northward and becomes the old highway to Fairview. Follow this road for 2.2 miles, then turn east on a gravel road for 0.75 miles to an intersection at the first curve in the road. Turn left and drive (~0.6 miles) until a concrete ditch is reached. Drive east along the ditch to a bridge, cross it. Drive north along the fence until the road ends or a place where 3 fences intersect and the road ends. The 0-foot baseline stake, which is red, is 12 paces west of the fence corner. The 100-foot baseline stake is rebar.





Map Name: Mount Pleasant. Diagrammatic Sketch

Township 14 S, Range 5E, Section 30 GPS: NAD 27, UTM 12S 4379842 N 464880 E

DISCUSSION

Cove Creek - Trend Study No. 16C-39

Cove Creek is a distinctive, yet favorable location for a trend study. It was also the location of an old 1978 line-intercept transect. It is representative of a unique bitterbrush type (tall form) in the foothills between Fairview and Mt. Pleasant. The site slopes very gently (0-5%) to the northwest at an elevation of 6,280 feet. All of the area is privately owned. Domestic sheep graze the area in winter and/or spring, and there have been a few cows in the large pasture. One fawn carcass from the previous winter was found in 1989. Rabbits and small rodents are fairly common. Pellet group transect data taken in 2002 estimated 35 deer days use/acre (88 ddu/ha), 8 elk days use/acre (20 edu/ha), and less than 1 cow day use/acre (2 cdu/ha).

Textural and chemical analysis designates soils as sandy loam with a neutral to slightly acidic reactivity (pH of 6.6). Effective rooting depth is estimated at almost 10 inches. Soil temperature was 66°F at almost 14 inches in depth. This soil is classified in the Birdow series which is well-drained with medium runoff and a slight hazard of erosion. In the Upland Loam range site, the potential plant community consists of 80% grasses, 10% forbs and 10% shrubs (by weight). Due to the long history of grazing, annuals and increasers dominate the herbaceous understory. Shrub interspaces are bare or are occupied by morning glory, storksbill, cheatgrass, and pricklypear cactus. These weedy species contribute a high proportion of the total vegetative cover. Vegetation and litter cover are high and adequately protect soils from erosion. An erosion condition class assessment determined this site as stable in 2002.

The dominant overstory species on the site is bitterbrush. It is a tall growth form which may be hybridizing with cliffrose. There are also prostrate forms on the site, often looking distorted due to severe hedging. Vigor has been generally normal on most of the bitterbrush population even though use has been heavy. Decadence has remained low ranging from 8% -13%. Utilization noticeably declined to a more moderate level in 2002, compared to the previous readings. Recruitment by young plants was high in 1989 at 48%, but has been very low since at 4% in 1997 and 0% in 2002. Density of bitterbrush has remained stable at just over 900 plants/acre. Bitterbrush leader growth averaged about 3.5 inches in 2002.

There are exceptionally large patches of pricklypear cactus throughout the site. Pricklypear density was estimated at 5,400 plants/acre in 2002. Basin big sagebrush had an estimated density of 2,940 plants/acre in 2002, an 18% increase since 1997. Young plants were abundant making up 22% of the population in both 1997 and 2002. Basin big sagebrush shows little to no use, normal vigor, and very low decadence. Tall oak clones occur scattered around the site.

Most of the preferred perennial grasses are associated with and protected by shrubs or cactus. In the past, cheatgrass and bulbous bluegrass were common in the interspaces, and combined to provide 91% of the grass cover in 1997. With drought conditions in 2002, cheatgrass significantly decreased in frequency, while bulbous bluegrass significantly increased. Bulbous bluegrass now provides an astounding 47% average cover value, which can best be described as a carpet over the site. Bulbous bluegrass is a short-lived perennial that has many characteristics of a winter annual. The most negative aspect is that is dries out early in the summer. More desirable perennial grasses are in relatively low abundance and include bluebunch wheatgrass, Indian ricegrass, Sandberg bluegrass, needle-and-thread, and sand dropseed. Sum of nested frequency for perennial grasses increased in 2002, due to the increase in bulbous bluegrass. The forb component is weedy and includes species such as morning glory, storksbill, bur buttercup, musk thistle, and houndstongue. Morning glory is by far the dominant forb on the site. With drought in 2002, sum of nested frequency for perennial forbs declined by one-third.

1989 APPARENT TREND ASSESSMENT

Trend for the key browse species, bitterbrush and big sagebrush, appears stable. They have sustained themselves for many years under heavy utilization. Much of the new bitterbrush growth is unavailable due to height. As far as overall range condition is concerned, the prominence of annuals, increasers, and pricklypear cactus indicates a downward trend for plant composition. The soil condition is good and trend appears stable.

1997 TREND ASSESSMENT

The trend for soil is up, with percent bare soil decreasing from 23% to 6%. Herbaceous cover is high, although the majority of the plant cover is contributed by annual and/or weedy species. Seventy percent of the total vegetative cover comes from herbaceous species which are more protective of the soils during intense summer storms. The key preferred browse is bitterbrush and basin big sagebrush. Together they contribute 70% of the browse cover. Both have good vigor and increased densities. Trend for browse is also up. Anymore increases for prickly pear cactus should be watched closely as it has shown significant increases since 1989. This site probably has more herbaceous cover than any other site in the unit with a total cover value of almost 52%. However, the majority of the cover is contributed by weedy species or annuals which make up 86% of the herbaceous cover. Trend for the herbaceous understory is down because of the very poor composition attributed by too many weedy species.

TREND ASSESSMENT
soil - up (5)
browse - up (5)
herbaceous understory - down (1) because of poor composition

2002 TREND ASSESSMENT

Trend for soil is slightly up. Bare soil continues to decrease and herbaceous vegetation is abundant. Sum of nested frequency of perennial species increased by 15%. Soils continue to show minimal erosion. Trend for browse is slightly up. Bitterbrush has a stable density, low decadency, and good vigor. Heavy use declined from 90% to 51%. Basin big sagebrush has an increasing population due to a high proportion of young plants (22%). Use is light, decadency is low, and vigor is normal. Trend for the herbaceous understory remains down. Although sum of nested frequency increased overall for perennial species, nearly all of this is attributed to the increase of bulbous bluegrass. Bulbous bluegrass is a short-lived perennial that has low forage value and has many annual characteristics. The forb composition remains dominated by weeds, primarily morning glory. With drought in 2002, sum of nested frequency for perennial forbs declined by one-third.

TREND ASSESSMENT
soil - slightly up (4)
browse - slightly up (4)
herbaceous understory - down (1)

HERBACEOUS TRENDS --
Herd unit 16C, Study no: 39

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'89	'97	'02	'89	'97	'02	'97	'02
G	Agropyron intermedium	-	-	9	-	-	4	-	.19
G	Agropyron spicatum	15	17	10	8	6	4	.77	.36
G	Bromus japonicus (a)	-	a2	b30	-	1	14	.03	.07
G	Bromus tectorum (a)	-	b302	a162	-	87	55	15.94	4.80
G	Oryzopsis hymenoides	1	-	5	1	-	2	.00	.18
G	Poa bulbosa	a-	b214	c303	-	65	84	14.45	47.29
G	Poa fendleriana	-	9	-	-	4	-	.07	-
G	Poa pratensis	b19	ab18	a3	8	7	1	.25	.03
G	Poa secunda	a23	a32	b67	9	13	25	1.11	1.14
G	Sporobolus cryptandrus	22	15	33	10	7	15	.13	.83
G	Stipa comata	ab27	a13	b59	11	4	19	.71	7.05
Total for Annual Grasses		0	304	192	0	88	69	15.97	4.87
Total for Perennial Grasses		107	318	489	47	106	154	17.52	57.09
Total for Grasses		107	622	681	47	194	223	33.49	61.95
F	Alyssum alyssoides (a)	-	a-	b76	-	-	29	-	.99
F	Allium spp.	a-	b10	a-	-	8	-	.09	-
F	Artemisia ludoviciana	3	-	-	1	-	-	-	-
F	Carduus nutans (a)	-	10	-	-	4	-	.40	-
F	Cirsium spp.	1	7	-	1	4	-	.21	-
F	Convolvulus arvensis	b234	b202	a148	86	71	63	12.14	3.55
F	Collinsia parviflora (a)	-	-	1	-	-	1	-	.00
F	Cryptantha spp.	-	4	-	-	2	-	.01	-
F	Cynoglossum officinale	b16	a-	a-	7	-	-	-	-
F	Epilobium brachycarpum (a)	-	11	5	-	6	2	.03	.01
F	Erodium cicutarium (a)	b127	c221	a9	49	74	4	3.83	.02
F	Eriogonum racemosum	9	8	7	3	3	3	.16	.04
F	Lactuca serriola	9	-	-	4	-	-	-	-
F	Lepidium spp. (a)	-	b55	a31	-	22	10	.92	.39
F	Lithospermum ruderale	4	-	-	2	-	-	-	-
F	Machaeranthera canescens	b23	ab10	a2	9	6	1	.03	.03
F	Phlox longifolia	3	3	5	3	2	2	.01	.01
F	Polygonum douglasii (a)	-	b38	c11	-	16	6	.13	.03
F	Ranunculus testiculatus (a)	-	b54	a11	-	20	5	.25	.05
F	Sisymbrium altissimum (a)	b6	a-	ab3	4	-	1	.00	.00
F	Sphaeralcea coccinea	-	2	4	-	1	2	.15	.03
F	Taraxacum officinale	-	3	-	-	1	-	.03	-
F	Tragopogon dubius	-	3	-	-	1	-	.00	-

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'89	'97	'02	'89	'97	'02	'97	'02
F	Viguiera multiflora	-	1	-	-	1	-	.03	-
Total for Annual Forbs		133	389	147	53	142	58	5.57	1.50
Total for Perennial Forbs		302	253	166	116	100	71	12.87	3.67
Total for Forbs		435	642	313	169	242	129	18.44	5.18

Values with different subscript letters are significantly different at alpha = 0.10

BROWSE TRENDS --
Herd unit 16C, Study no: 39

Type	Species	Strip Frequency		Average Cover %	
		'97	'02	'97	'02
B	Artemisia tridentata tridentata	47	48	5.71	11.89
B	Gutierrezia sarothrae	4	1	.03	.00
B	Opuntia spp.	67	65	5.97	3.95
B	Purshia tridentata	37	42	10.05	12.92
B	Quercus gambelii	4	4	.53	1.00
B	Rosa woodsii	1	2	-	-
Total for Browse		160	162	22.29	29.78

CANOPY COVER -- LINE INTERCEPT
Herd unit 16C, Study no: 39

Species	Percent Cover	
	'97	'02
Artemisia tridentata tridentata	-	11.75
Artemisia tridentata wyomingensis	-	3.42
Opuntia spp.	-	2.83
Purshia tridentata	-	12.58
Quercus gambelii	-	.83
Rosa woodsii	-	.05

Key Browse Annual Leader Growth
Herd unit 16C , Study no: 39

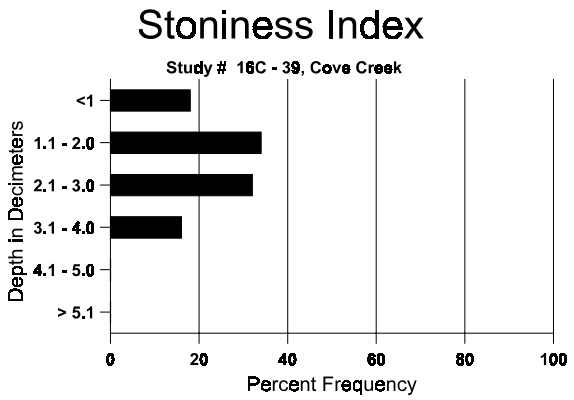
Species	Average leader growth (in)
	'02
Artemisia tridentata tridentata	3.2
Purshia tridentata	3.5

BASIC COVER --
Herd unit 16C, Study no: 39

Cover Type	Nested Frequency		Average Cover %		
	'97	'02	'89	'97	'02
Vegetation	391	386	20.50	62.59	80.27
Rock	35	24	3.75	1.16	.66
Pavement	50	47	0	.15	.25
Litter	392	360	53.25	49.92	28.67
Cryptogams	24	41	0	.26	.71
Bare Ground	147	122	22.50	5.58	3.61

SOIL ANALYSIS DATA --
Herd Unit 16C, Study no: 39, Cove Creek

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
9.7	65.8 (13.3)	6.6	66.4	19.8	13.8	1.7	30.9	208.0	.5



PELLET GROUP FREQUENCY --
Herd unit 16C, Study no: 39

Type	Quadrat Frequency		Pellet Transect	
	'97	'02	Pellet Groups per Acre ⁄02	Days Use per Acre (ha) ⁄02
Sheep	20	1	17	1 (3)
Rabbit	18	29	-	-
Horse	-	1	-	-
Elk	11	3	104	8 (20)
Deer	34	22	461	35 (88)
Cattle	-	2	9	1 (2)

BROWSE CHARACTERISTICS --
Herd unit 16C, Study no: 39

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia tridentata tridentata																		
S	89	12	-	-	6	-	-	-	-	-	18	-	-	-	600			18
	97	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
	02	5	-	-	-	-	-	-	-	-	5	-	-	-	100			5
Y	89	13	11	3	8	-	-	-	-	-	33	-	-	2	1166			35
	97	25	1	-	-	-	-	-	-	-	26	-	-	-	520			26
	02	33	-	-	-	-	-	-	-	-	33	-	-	-	660			33
M	89	1	1	1	-	-	-	-	-	-	3	-	-	-	100	28	30	3
	97	82	5	-	6	-	-	-	-	-	93	-	-	-	1860	34	39	93
	02	109	-	-	-	-	-	-	-	-	109	-	-	-	2180	31	37	109
D	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	02	3	-	-	-	-	-	2	-	-	3	-	-	2	100			5
X	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	80			4
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	80			4

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'89	32%	11%	05%	+47%
'97	05%	00%	00%	+18%
'02	00%	00%	01%	

Total Plants/Acre (excluding Dead & Seedlings)				
'89	1266	Dec:		0%
'97	2400			1%
'02	2940			3%

Gutierrezia sarothrae																		
M	89	1	-	-	-	-	-	-	-	-	1	-	-	-	33	5	4	1
	97	17	-	-	-	-	-	-	-	-	17	-	-	-	340	16	15	17
	02	1	-	-	-	-	-	-	-	-	1	-	-	-	20	10	13	1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'89	00%	00%	00%	+90%
'97	00%	00%	00%	-94%
'02	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)			
'89	33	Dec:	-
'97	340		-
'02	20		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Opuntia spp.																		
S	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	89	5	-	-	-	-	-	-	-	-	5	-	-	-	166			5
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	12	-	-	-	-	-	-	-	-	11	1	-	-	240			12
M	89	13	-	-	-	-	-	-	-	-	12	-	1	-	433	9	52	13
	97	310	-	-	13	-	-	-	-	-	323	-	-	-	6460	7	21	323
	02	231	-	-	2	-	-	-	-	-	233	-	-	-	4660	7	15	233
D	89	4	-	-	-	-	-	-	-	-	4	-	-	-	133			4
	97	19	-	-	-	-	-	-	-	-	3	-	-	16	380			19
	02	23	-	-	-	-	-	2	-	-	15	-	4	6	500			25
X	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	160			8
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	40			2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'89	00%	00%	05%	+89%
'97	00%	00%	05%	-21%
'02	00%	00%	04%	

Total Plants/Acre (excluding Dead & Seedlings)				
'89	732	Dec:		18%
'97	6840			6%
'02	5400			9%

Purshia tridentata																		
S	89	-	1	-	2	-	-	-	-	-	3	-	-	-	100			3
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	89	2	5	3	1	1	-	-	-	-	12	-	-	-	400			12
	97	1	1	-	-	-	-	-	-	-	2	-	-	-	40			2
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	89	-	1	9	-	-	-	1	-	-	11	-	-	-	366	38	53	11
	97	1	1	18	1	-	19	-	-	-	40	-	-	-	800	48	67	40
	02	5	11	22	-	-	-	1	4	-	43	-	-	-	860	37	57	43
D	89	-	-	1	-	-	1	-	-	-	2	-	-	-	66			2
	97	-	-	5	-	-	1	-	-	-	5	-	-	1	120			6
	02	-	-	2	-	2	-	-	-	-	1	-	-	3	80			4
X	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	100			5
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'89	28%	56%	00%	+13%
'97	04%	90%	02%	- 2%
'02	28%	51%	06%	

Total Plants/Acre (excluding Dead & Seedlings)				
'89	832	Dec:		8%
'97	960			13%
'02	940			9%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Quercus gambelii																		
Y	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	8	-	-	-	-	-	-	-	-	8	-	-	-	160			8
	02	13	-	-	-	-	-	-	-	-	13	-	-	-	260			13
M	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	97	12	27	-	-	-	-	-	-	-	39	-	-	-	780	17	17	39
	02	33	-	-	-	-	-	-	-	-	33	-	-	-	660	25	14	33
D	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	36	-	-	-	-	-	-	-	-	36	-	-	-	720			36
X	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	40			2
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'89	00%	00%	00%	
'97	57%	00%	00%	+43%
'02	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'89	0	Dec:	0%
	'97	940		0%
	'02	1640		44%

Rosa woodsii																		
M	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	97	4	-	-	-	-	-	-	-	-	4	-	-	-	80	13	12	4
	02	7	-	-	-	-	-	-	-	-	7	-	-	-	140	11	7	7

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'89	00%	00%	00%	
'97	00%	00%	00%	+43%
'02	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'89	0	Dec:	-
	'97	80		-
	'02	140		-